



City of SeaTac

Policies and Procedures

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| Policy Number: | PW-018 |
| Policy Name: | City Wide ROW Lighting Policy |
| Department(s): | Public Works |
| Effective Date: | August 19, 2022 |
| Supersedes: | N/A |
| Prepared by: | Anita Woodmass, Senior Management Analyst |
| Approved by: | William Appleton, Public Works Director |
| Signature: |  |
| Approved by: | Evan Maxim, Community and Economic Development Director |
| Signature: |  |

Purpose: To provide guidance for staff and developers on the application of street light standards (including street and pedestrian lighting) within City (public) rights-of-way. This policy does not apply to on-site private development, parks or City facilities located within the City of SeaTac. The City currently has several different light pole designs within the City rights-of-way. The application of these standards, over many years, will reduce the variability in the light poles and help create a more consistent streetscape that will help identify SeaTac and allow the City to effectively manage its lighting assets.

Policy: This policy provides street light standards and guidelines for the design, illumination and installation of roadway and pedestrian lighting within the City (public) rights-of-way. The City shall require the installation new light poles for development within City rights-of-way. New light poles shall be one of the two designs specified in this policy and procedure.

Applicability: Street lighting shall be required in accordance with SMC13.200.020 Off Site Improvements.

This policy also applies to all Public Works Capital Improvement Projects and all private development installation of light poles within the City ROW.

Private development is encouraged and may be required, through conditions of approval on a land use decision, to install lighting along driveways and private roads in accordance with the 'Light Pole Design' and guideline provisions detailed in this policy.

Procedure: This Policy and any attachments, provide guidance on a range of matters pertaining to lighting located within the City rights-of-way. Applicants are encouraged to contact the Engineering Review Division for any clarification regarding technical specifications not covered in this policy.

Required Standards and Regulations

This section is divided into two sections:

- 1) Light Pole Design: The light pole aesthetic, location and spec sheets; and
- 2) Street Lighting Guidelines: Lighting levels and the 'operations' related requirements.

Section One: Light Pole Design

This Policy adopts an approach for lighting within City rights-of-way whereby areas of the City are placed into one of two categories; "Special Areas" (see Figure One: Lighting Map) and "All Other Areas" (See Figure One: Lighting Map).

Special Areas (see Figure One: Lighting Map)

Location of Light Poles:

"Special Areas" of the city generally includes rights-of-way located along International Boulevard and the area contained within the designated Urban Center Boundary. In some instances, to ensure a contiguous and consistent streetscape, the area identified as a Special Area is expanded beyond the Urban Center Boundary and is reflected in Figure One. The Special Areas will install decorative style lighting along both sides of the road that is reflective of a higher density, walkable urban area and is detailed in Street Lighting Guidelines: Section 2.2 – Approved Street Lighting Fixtures & Poles.

Where Figure One shows a special area ending at an intersection, the Special Area lighting shall be applied at all corners of the intersection and is subject to confirmation by the Director of Public Works. If Special Area lighting ends at a mid block or where there is a conflict of the light pole design, it is at the discretion of the Public Works Director or designee to determine the applicable light pole design.

Specification Sheets

<\\teletraan1\data\PublicWorks\Projects\Capital Projects\ST-141 32nd Ave S and 176th st pedestrian improvements\Design\Exhibits\Lighting Standards\Lighting - 50% Specs.pdf>

Applicants can request these documents from the Engineering Review Division. These documents may be updated to reflect manufacturing changes.

Light Pole Visuals

- Roadway & Pedestrian Fixture: Ragni Lighting R-Light Cobrahead
- Roadway & Pedestrian Pole: AEC Round Tapered Steel Pole
- Bracket Arm: AEC LTL

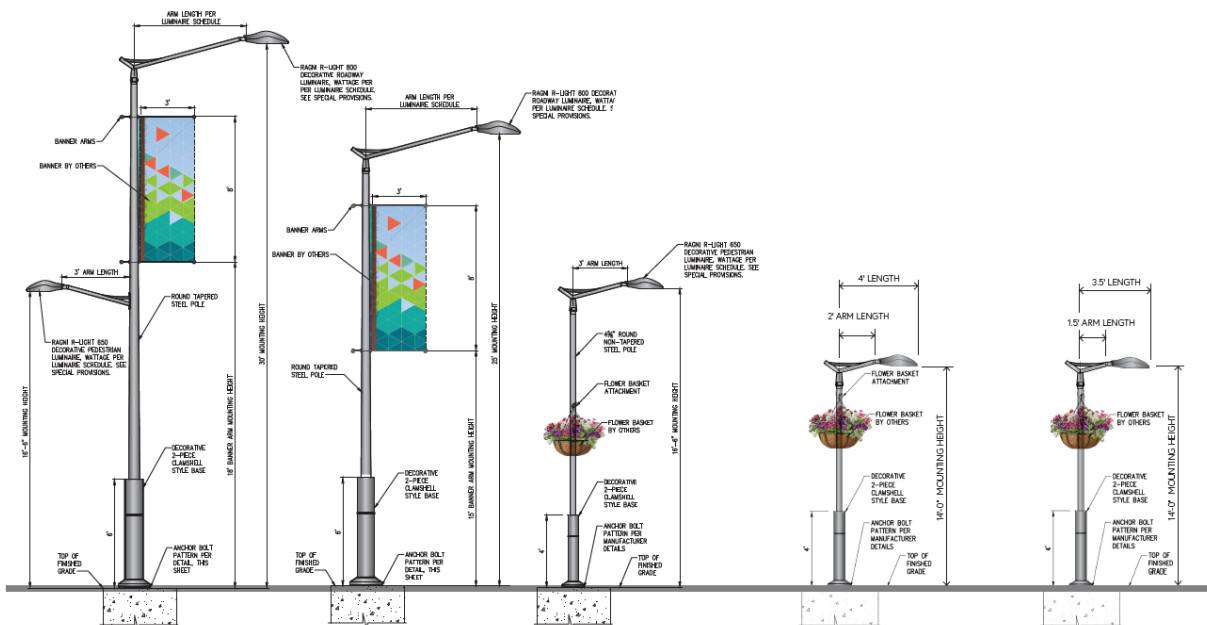


Diagram One: Special Area Lighting Illustration

All Other Areas (see Figure One: Lighting Map)

Location of Light Poles:

”All Other Area’s” includes all remaining areas of the city that are located outside of the Special Area’s designation. These areas will install the light pole detailed in in Street Lighting Design Guide: Section 2.2 – Approved Street Lighting Fixtures & Poles.

Specification Sheets

<\\teletraan1\data\PublicWorks\Projects\Capital Projects\ST-141 32nd Ave S and 176th st pedestrian improvements\Design\Exhibits\Lighting Standards\Lighting - Non Special areas Specifications.pdf>

Applicants can request these documents from the Engineering Review Division. These documents may be updated to reflect manufacturing changes.

Light Pole Visuals

- Roadway & Pedestrian Fixture:
 - Roadway: Cyclone Domia Family Pendant
 - Pedestrian: Lumec Domus Family Pendant
- Roadway & Pedestrian Pole:
 - Roadway: Valmont Round Fluted Tapered Pole
 - Pedestrian: Valmont Round Fluted Tapered Pole with Osceola Base
- Bracket Arm:
 - Roadway: Cyclone M534
 - Pedestrian: Lumec AC-P108

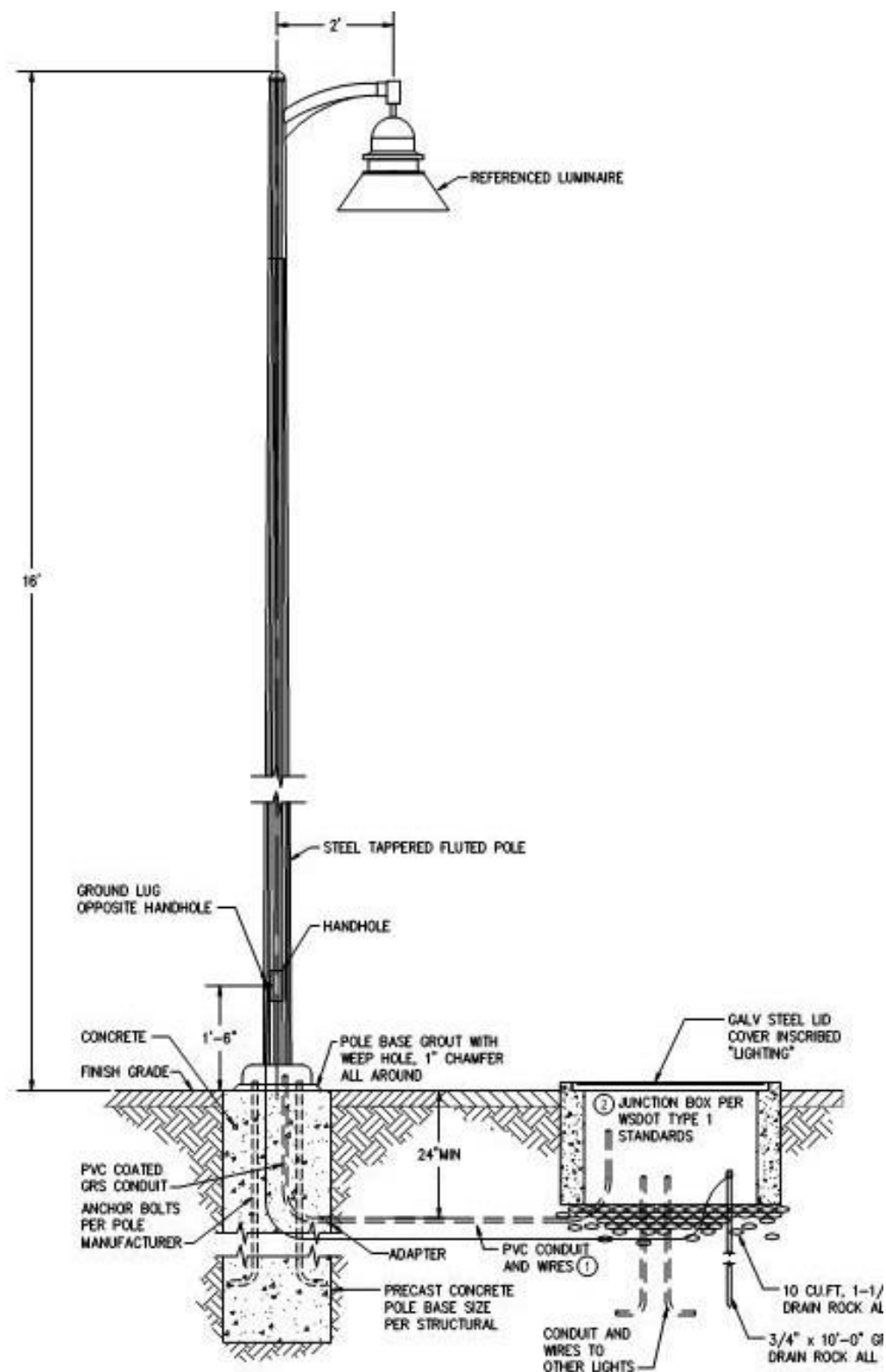


Diagram Two: 'All Other Area's' Lighting Illustration



Diagram Three: Photo Image of 'All Other Area's' Lighting

Section Two: Street Lighting Guidelines

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Chapter 1 - General

1.1 - Introduction

This document provides a guideline for preparation of street lighting design within the City of SeaTac. Lighting designs for all projects shall be required to meet all applicable lighting levels as described in this document or as specified by the City Engineer.

All final approved street lighting plans, specifications, and supporting documents shall be prepared under the supervision of a Washington State Registered Professional Engineer with an endorsement in Civil or Electrical Engineering. Plans and specifications shall be sealed and signed by the Professional Engineer.

The Design Engineer shall comply with the requirements within this document as well as the latest edition of the following publications:

- I. National Electrical Code (NFPA 70)
- II. ANSI/IES RP-8-18 Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting
- III. Current Edition of the Washington State Department of Transportation (WSDOT) *Standard Specifications for Road, Bridge, and Municipal Construction*
- IV. Current Edition of the Washington State Department of Transportation (WSDOT) Standard Plans and Details
- V. Current Edition of the *King County Road Design and Construction Standards*
- VI. Current Edition of the *City of SeaTac Addendum to Road Standards*

Chapter 2 – Design Parameters

2.1 - Photometric Design

Street lighting is to be designed using the illuminance method with the latest AGI32 lighting analysis software. The following are specific parameters to be set within the AGI32 software:

- Calculation point grid spacing of 5 feet by 5 feet
 - Roadway calculation area shall extend from face of curb to face of curb.
 - Intersection calculation area shall include the crosswalks and extend to the stop bar for all approaches.
 - Sidewalk calculation area shall be drawn as a straight line through the center of sidewalk with calculation points at 5-foot spacing.
 - Midblock crossing shall be based on WSDOT Design Manual Chapter 1040 Exhibit 1040-16.
- A total Light Loss Factor (LLF) of 0.62 shall be used for all high pressure sodium (HPS) and metal halide (MH) fixtures and 0.80 for all light emitting diode (LED) fixtures.
- Illuminance units in foot-candles (FC)

Photometric design shall depend on the roadway and land use classification. See the roadway classification map in the City's 2015 Transportation Master Plan for further information.

1. Principal Arterial, Minor Arterial, Collector, and Local – Commercial roadway classification shall include roadway scale and pedestrian scale lighting meeting the design target light levels in the following tables.
2. Local – Residential roadway classification shall include only pedestrian scale lighting, unless otherwise required by the City Engineer.
3. Midblock crossings shall be designed to intersection design target light levels.
 - a. New developments and City projects shall evaluate any existing midblock crossings within the project limits for any necessary lighting improvements.
4. Temporary lighting may be required based on the following:
 - a. Existing illumination cannot be maintained
 - b. Temporary Traffic Signals
 - c. Complex changes to geometry
 - d. Any additional situations as deemed necessary by the City Engineer
5. Roundabouts
 - a. Roundabouts shall be designed to WSDOT Design Manual Chapters 1040 and 1320.
6. Any other situations not listed in this document shall be governed by the latest ANSI/IES RP-8 guidelines.

The following tables provide the design target light levels for Minimum Maintained Average and Maximum Uniformity Ratio within the City of SeaTac for intersections, roadway, and sidewalks.

Table 1: Design Target Light Levels for Intersections

| Roadway Classification | Minimum Maintained Average Horizontal Illuminance (foot-candles)* | Maximum Uniformity Ratio** |
|------------------------|---|----------------------------------|
| Principal Arterial | 1.5 | 4:1 |
| Minor Arterial | 1.5 | 4:1 |
| Collector | 1.2 | 4:1 |
| Local - Commercial | 0.9 | 4:1 |
| Local - Residential | N/A | N/A |

Table 2: Design Target Light Levels for Roadways

| Roadway Classification | Minimum Maintained Average Horizontal Illuminance (foot-candles)* | Maximum Uniformity Ratio** |
|------------------------|---|----------------------------------|
| Principal Arterial | 1.3 | 3:1 |
| Minor Arterial | 1.3 | 3:1 |
| Collector | 0.9 | 4:1 |
| Local - Commercial | 0.8 | 6:1 |
| Local - Residential | N/A | N/A |

Table 3: Design Target Light Levels for Sidewalks

| Roadway Classification | Minimum Maintained Average Horizontal Illuminance (foot-candles)* | Maximum Uniformity Ratio** |
|------------------------|---|-------------------------------|
| Principal Arterial | 0.5 | 4:1 |
| Minor Arterial | 0.5 | 4:1 |
| Collector | 0.5 | 4:1 |
| Local - Commercial | 0.5 | 4:1 |
| Local - Residential | 0.3 | 6:1 |

* Design values should be no higher than 20% above the minimum average values. Exceptions are only allowed upon approval by the City Engineer.

** Maximum Uniformity Ratio = Minimum Average Maintained Horizontal Illuminance / Minimum Illuminance

2.2 – Approved Street Lighting Fixtures & Poles

Light Emitting Diode (LED) street lighting fixtures shall be used for all new and retrofit installation within the City. Various street light fixtures and poles have been identified by the City to be used in specific locations within the City based on subarea as well as citywide. Utilization of a street light fixture and pole not listed here will not be allowed unless approved by the City Engineer. A map of the subareas within the City can be seen in the Land Use Classification Map in the City’s current Comprehensive Plan. Table 4 shows the approved fixtures and poles to be utilized within the City.

Table 4: Approved Street Light Fixtures

| <u>Location</u> <u>(See Figure One and Figure Two)</u> | <u>Roadway & Pedestrian Fixture</u> | <u>Roadway & Pedestrian Pole</u> | <u>Bracket Arm</u> |
|---|--|---|--|
| All Other Area’s (City wide) | Cyclone Domia Family Pendant or Lumec Domus Family Pendant | Roadway: Valmont Round Fluted Tapered Pole Pedestrian: Valmont Round Fluted Tapered Pole with Osceola Base | Cyclone M5 34 or Lumec AC-P10 8 |
| Special Area’s | Ragni Lighting R-Light Cobrahead | Holophane Site Link Pole Or Approved Equal Small Cell Wireless Compatible Pole | Holophane New York Or Approved Equal |
| WSDOT Facilities | See latest WSDOT List of Approved LED Luminaires: https://wsdot.wa.gov/engineering-standards/construction-materials/electrical-materials | See WSDOT Standard Plans | See WSDOT Standard Plans |

The following are additional relevant details:

1. Wattage

- a. Wattage of the street lighting fixture shall be based on the photometric analysis conducted by the Design Engineer.
 - b. Utilize the latest specs as published online by the street light manufacturer for photometric analysis.
2. Distribution
 - a. Utilize Type 3 distribution. Other distributions may be utilized on a case-by-case basis as approved by the City Engineer.
3. Cutoff
 - a. Street light fixtures shall be full cutoff or otherwise specified in this document.
4. Color Temperature
 - a. Between 3,000 to 4,000 Kelvin (K) shall be used.
5. Mounting Height
 - a. Roadway scale fixtures shall be mounted no higher than 35 feet as measured from the top of roadway to the bottom of fixture.
 - b. Special Area's: Pedestrian dedicated/oriented lighting scale fixtures shall be mounted at 14' and oriented to the sidewalk as measured from the top of sidewalk to the bottom of fixture, unless otherwise approved by the City Engineer.
 - c. All Other Area's: Pedestrian dedicated/oriented lighting scale fixtures shall be mounted at 16' – 16.5' and oriented to the sidewalk as measured from the top of sidewalk to the bottom of fixture, unless otherwise approved by the City Engineer.
 - d. Mounting heights shall be consistent along corridors unless otherwise approved by the City Engineer.
6. Arm
 - a. Arm length will be dictated by the photometric analysis.
 - b. Arm length shall be consistent along corridors unless otherwise approved by the City Engineer.
 - c. Arm length is typically specified in 2-foot increments (i.e., 8-foot, 10-foot, 12-foot, etc.)
 - d. Arm length shall be no greater than 16 feet.
 - e. Arms shall be oriented perpendicular to the roadway centerline unless otherwise noted within the plans.
7. Base
 - a. Street light base shall have a hand hole for maintenance access.
 - b. Street light bases shall have slip bases per WSDOT Standard Plans J-28.42 and anchor bolt assemblies per WSDOT Standard Plans J-28.30.
 - c. Fixed bases for street lights shall be considered based on engineering analysis in locations with high pedestrian activity if there is a concern a dislodged street light may pose more of a concern to pedestrians rather than vehicular traffic, as approved by the City Engineer.
8. House side shields
 - a. May be required by the City Engineer on a case-to-case basis.
9. Finish, Coating, & Color
 - a. All poles, luminaires, arms, bases, and subassemblies shall be factory primed and finish painted with polyester powder coating
 - b. All poles, luminaires, arms, bases, and subassemblies shall be painted in RAL-9005 "Jet Black" in color except the following:
 - i. Special Area (Urban Center Boundary) per Table 4 above shall be "Glossy Anodized Silver" (38/91020) in color by Tiger Drylac Powder Coating.
 - ii. WSDOT Facilities shall be per their standard specifications
 - c. All poles shall have an anti-graffiti coating.
10. Foundation Design

- a. Foundations shall be per WSDOT Standard Plan J.28-30 unless otherwise designed by a licensed geotechnical/structural engineer and approved by the City Engineer.
11. Photoelectric Control
 - a. The street light closest to the service cabinet shall have a 7 pin type photoelectric control. A 3/C #14 IMSA cable shall be provided from the photoelectric control to the service cabinet.
12. Ground-Fault Circuit Interrupter (GFCI)
 - a. All poles shall be equipped with a GFCI mounted at a minimum 10 feet as measured from the adjacent roadway surface.
 - b. GFCI shall be rated for 20 amps, 120V.
 - c. GFCI shall have a weatherproof cover with the option for locking capabilities.
13. Accessories
 - a. All poles shall have the option to order decorative banner arms and/or flower baskets at the City Engineer request.

2.3 – Street Lighting System Design

The following information is intended to serve as a guide for the Designer in laying out the street lighting system design.

1. Pole Spacing – shall be determined from the photometric analysis to achieve the design target light levels and uniformity ratio
 - a. Street lighting for midblock crosswalks is preferred to be located upstream of the crossing to provide positive front lighting. Two street lights are required.
 - b. Street light poles shall be placed a minimum of 5 feet away from a driveway.
 - c. Street light poles shall be spaced away from the drip lines of street trees.
2. Configuration – the street lighting system shall be designed for a staggered configuration on both sides of the street.
 - a. Single sided configuration will only be allowed due to existing constraints such as utility conflicts or other obstructions, and shall be approved by the City Engineer.
3. Pole Offset – the location of the pole shall maintain the following offsets:
 - a. Curb present – minimum of 3 feet from the face of curb to the face of pole
 - b. Curb not present – minimum of 10 feet from the edge of pavement to the face of pole per clear zone guidance.
 - c. Do not place street lights or junction boxes within ditch sections and/or locations where water can accumulate.
 - d. Minimum of 20 feet away from street trees.
4. Conduit – conduit shall be either Schedule 40 PVC or Schedule 80 PVC
 - a. Utilize Schedule 80 PVC underneath roadways and shoulder areas.
 - b. Utilize Schedule 40 PVC in all other situations.
 - c. The minimum conduit size is 2” and maximum conduit size is 4”. Half size conduits (i.e. 2.5”) will be allowed with approval from the City Engineer.
 - d. The street lighting conductors shall not share conduit with other systems (i.e. signals, ITS, power).
 - e. Conduit fill shall be calculated and provided for all installations. Maximum conduit fill for new installations shall be 26% per NEC guidelines. Modification to existing conduit fill shall be 40% per NEC guidelines.
 - f. Ground wire shall be included in all street lighting conduit and be equal to the maximum wire size in the conduit, minimum #8.
 - g. Detectable pull tape shall be included all spare street lighting conduit.
 - h. A minimum 2” Schedule 80 PVC spare conduit shall be included in all roadway crossings.

- i. A minimum 2" spare conduit shall be included from the junction box adjacent to the service cabinet and the service cabinet.
 - j. Conduit shall be installed via directional boring. Installation using open trenching is considered on a case by case basis.
- 5. Circuitry
 - a. A street lighting system shall have a minimum of two separate street lighting circuit.
 - i. One circuit shall be dedicated to one side of the street for the situation where if street lights on one side of the roadway go out the street lights on the other side of the roadway will still be on.
 - b. At signalized intersections, street lighting shall be on a separate circuit from the street lighting system.
- 6. Conductors & Wiring
 - a. Minimum wire size for illumination systems shall be #8 AWG.
 - b. Maximum calculated voltage drop shall not exceed 5% per street lighting circuit.
 - c. A wiring schedule listing conduit size, conductors, and conduit fill percentage will be required on all street lighting plans in additions to supporting calculations.
 - d. A note on the street lighting plans stating "all conductors for street lighting shall be labeled within junction boxes".
 - e. Conductors may be either copper or aluminum in material type.
- 7. Splices
 - a. Splices within junction boxes shall be per the products listed in the WSDOT Qualified Product List (QPL) under Standard Specification 9-29.12(1).
 - b. Fused disconnect kit shall be provided at all street lights within each pole base and be per the products listed in the WSDOT Qualified Product List (QPL) under Standard Specification 9-29.7.
- 8. Junction Boxes
 - a. Junction boxes shall be Type 1, 2, and 8 per WSDOT Standard Plans J-40.10 and J-40.30.
 - i. Junction boxes shall have a locking lid.
 - b. Junction boxes sizing shall be determined by the maximum number of conduit diameters entering the box including spares.
 - i. Type 1 Junction Box: Maximum of 6 inches
 - ii. Type 2 Junction Box: Maximum of 12 inches
 - iii. Type 8 Junction Box: Maximum of 24 inches
 - c. A junction box shall be placed within a maximum of 10 feet (preferably 5 feet) of every street light pole.
 - d. A minimum Type 2 junction box shall be placed adjacent to the service cabinet.
 - e. Junction boxes located within sidewalk sections shall have non-skid frames and lids.
 - f. Junction boxes shall not be located within pedestrian curb ramps, driveways, or traveled way.
 - g. Spacing between junction boxes shall not exceed 360 feet in straight segments or 180 feet in curved segments.
- 9. Clearances
 - a. The designer shall locate poles to not conflict with existing or proposed underground utilities.
 - i. Consider potholing for existing underground utilities within 10 feet of any foundation.
 - b. Maintain clearances around street light poles per the American with Disabilities Act (ADA) and Proposed Public Rights-of-Way (PROWAG) accessibility guidelines.
 - c. Account for proposed architectural elements such as building overhang, awnings, etc. when placing proposed street lights and maintain clearance from these elements.
 - d. The designer shall not place street light poles within overhead power lines and clearances must be maintained. See the Washington Administrative Code (WAC) 296-24-960 for further details.

10. Service Cabinets

- a. Power service shall be 120/240 V single phase.
 - b. Power service shall be metered.
 - c. Service cabinet shall be Type D per WSDOT Standard Plans J-10.10, J-10.15, J-10.21, and J-60.05.
 - d. Service cabinets shall only be utilized for street lighting and traffic signal use only.
 - e. A breaker schedule shall be required on all street lighting plans and supporting calculations shall be submitted with the plans.
 - f. Coordinate with the City and/or Utility Provider for power source location.
 - g. All busswork shall have a minimum rating of 250 amps.
- 11. Existing street lights
 - a. Existing street lights and equipment for removal shall be salvaged and delivered to the agency with ownership (City, Seattle City Light, WSDOT, etc.).
- 12. Transit
 - a. Lighting for Transit Facilities shall be governed by the Transit Agency and will require review and approval from said agency.
 - i. King County Metro – See King County Metro Transit Route Facilities Guidelines Chapter 5.7
 - ii. Sound Transit – See latest Sound Transit Design Criteria Manual
- 13. Small Wireless Facilities
 - a.** Wireless Communication Facility installations on street light poles shall comply with requirements as outlined in SMC 15.480.
 - b.** Wireless Communication Facility Poles installed as part of the City of SeaTac planned Capital Improvement Program (CIP) within the areas listed in Table 4 will be provided by the telecom utility or the City of SeaTac will be reimbursed by the telecommunication utility for installation.

Chapter 3 – Street Lighting Design Checklist

This checklist is intended to help the designer with preparation of the street lighting plans. The checklist below is the minimum required for submittal to the City. Additional calculations, documentation, etc. may be required at the request of the City.

- Street Lighting Plans
 - Street Lighting Layout
 - Existing and proposed street lights
 - Existing and proposed street trees
 - Junction box
 - Conduit
 - Above and underground utilities
 - Architectural elements such as building overhang, awnings, etc.
 - Existing and proposed service cabinets
 - Existing and proposed traffic signal equipment (if necessary)
 - Power source connection from service cabinet
 - Right-of-way line and easements
 - Pole Schedule
 - Station/Offset or Northing/Easting
 - Mounting Height
 - Arm Length
 - Wattage
 - Circuit
 - Fixture Model
 - Pole Type
 - Foundation
 - Additional Comments
 - Light Level Table
 - Intersection, roadway, and sidewalk listed separately
 - Target and calculated average maintained illuminance and uniformity ratios
 - Breaker Schedule
 - Illumination branch breaker sizing
 - Contactor sizing
 - Street Lighting One Line Diagram
 - Circuits
 - Service cabinet(s)
 - Power source location
 - Wiring Schedule
 - Conduit size
 - Conductors
 - Conduit fill percentages
 - Comments
 - North Arrow
 - Scale Bar
- AGi32 Analysis Supporting Documentation
 - Cover Sheet with AGI Banner
 - Luminaire Definitions (Basic) checked
 - Calculation Summary (Basic) checked
 - AGi32 Layout showing:
 - Street light layout
 - Calculation points
 - Street light isolines
 - AGi32 design file (may be requested by City)

- Street Lighting Supporting Calculations
 - Line Loss (voltage drop)
 - Breaker Sizing
 - Conduit Fill

- CAD File
 - Street Light pole locations
 - Junction boxes
 - Conduits
 - Service Cabinet(s)

Figure One: Lighting Map

